V. PLAN PERFORMANCE

This chapter summarizes how well the 2008 RTP performs in meeting its adopted goals and satisfying State and federal requirements. Table 5.1 summarizes goals and their related performance outcomes. One or more performance measures were developed for each of these outcomes to quantify the Plan's performance. These goals and outcomes were used successfully in developing the update to the 2004 RTP.

TABLE 5.1 2008 RTP GOALS AND RELATED PERFORMANCE OUTCOMES

RTP Goals	Mobility	Accessibility	Reliability	Productivity	Safety	Sustainability	Preservation	Cost-Effectiveness	Environmental	Environmental Justice
Maximize mobility and accessibility for all people and goods in the region	✓	✓						✓		✓
Ensure travel safety and reliability for all people and goods in the region	✓		✓		✓					
Preserve and ensure a sustainable regional transportation system						✓	✓			
Maximize the productivity of our transportation system	✓			✓						
Protect the environment, improve air quality and promote energy efficiency									✓	✓
Encourage land use and growth patterns that complement our transportation investments	✓	✓							✓	
Maximize the security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies*										

* SCAG does not yet have an agreed-upon security performance measure, therefore it is not included in this table.

PLAN INVESTMENT PERFORMANCE

This section provides detailed information on each of the performance outcomes and related measures approved by the Regional Council in 2002. The basic concept for each criterion is to compare the performance of the Plan (2035) to both the Base Year (2003) and the Baseline scenario for 2035. The Plan is the selected strategy to guide the Region's transportation planning over the next few decades. The Baseline represents "business as usual" and a future condition in which the Plan is not implemented. It assumes current land-use trends and only the completion of: projects currently under construction or right-of-way acquisition; projects that have completed the National Environmental Policy Act (NEPA) process; or projects that come from the first year of the previous RTP/RTIP. The data for the analysis is based on the SCAG regional travel demand model results.

MOBILITY

The mobility performance outcome relies on two commonly used measures: speed and delay. Speed and delay were computed using SCAG's regional travel demand model with results as follows:

- Speed is the average speed experienced by travelers regardless of mode in miles per hour (mph).
- Delay is the difference between the actual travel time and travel time that would be experienced if a person traveled at the legal speed limit. This measure is reported as person-hours of delay, which is presented here as a total and as delay per capita. The latter normalizes the results with the expected population growth during the Plan period (i.e., through 2035).

Figure 5.1 compares the speeds of the three scenarios. It shows that the Plan improves average daily speeds by eight percent compared to the 2035 Baseline and represents a less than 2 mile-per-hour decline over 2003 Base Year results.

FIGURE 5.1 AVERAGE DAILY SPEED

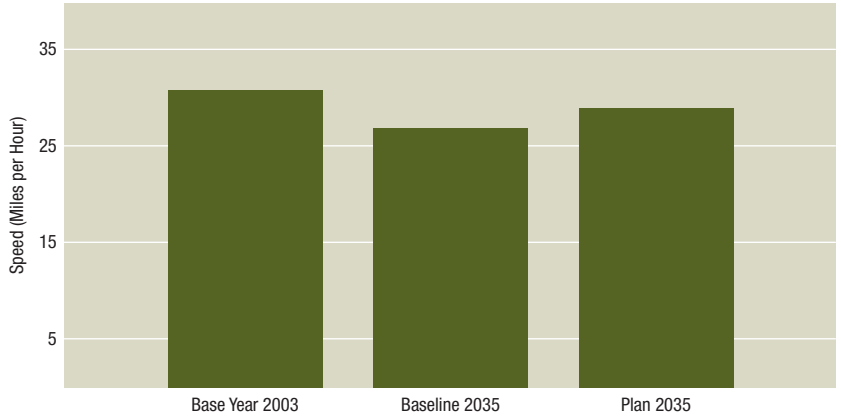


FIGURE 5.2 DAILY PERSON HOURS OF DELAY

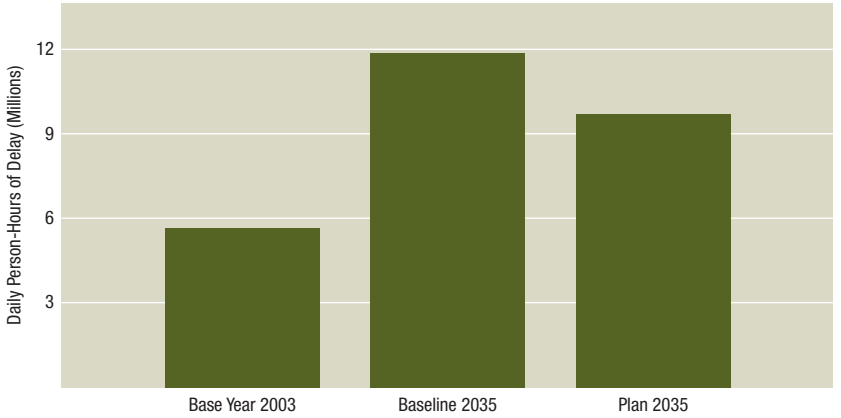


Figure 5.2 compares delay results and shows that the Plan reduces total daily person delay by 18 percent compared to the Baseline, but also represents an increase of 71 percent over Base Year conditions. This increase reflects the growth in the Region and the resulting incremental travel.

Figure 5.3 compares average daily delay per capita, which is a measure that takes into account that there will be more people traveling on the Region's transportation system by 2035. The results tell a different story. Whereas total delay for the Plan increases by 70 percent over Base Year conditions, each person in the region experiences only a 26 percent increase, or a five-minute increase travel delay on a per-capita basis.

FIGURE 5.3 AVERAGE DAILY DELAY PER CAPITA

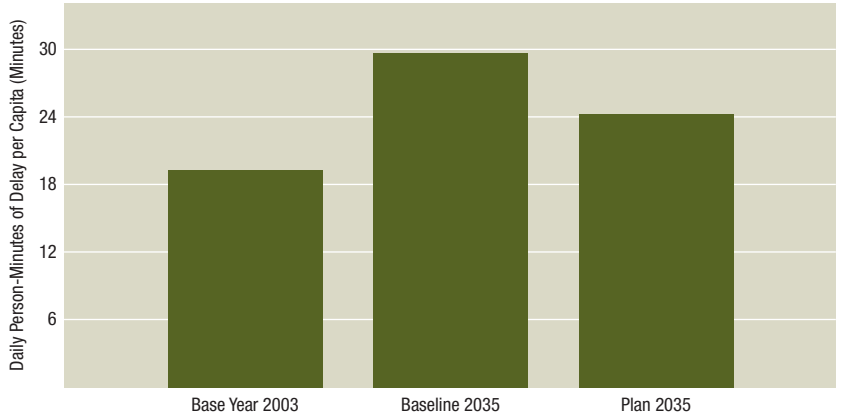
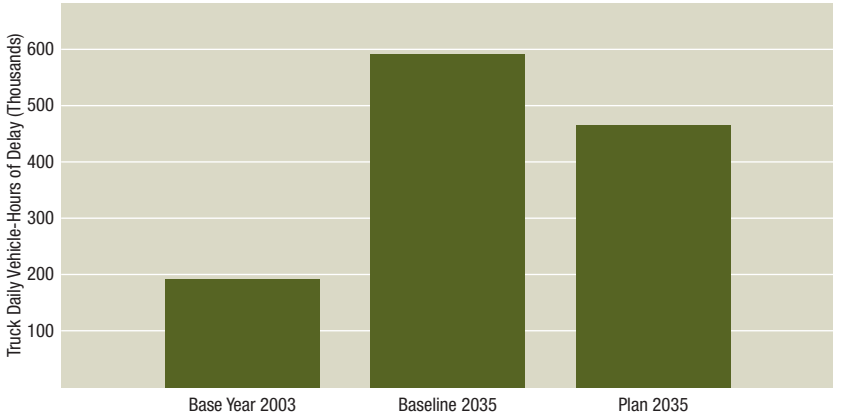


FIGURE 5.4 AVERAGE DAILY HEAVY DUTY TRUCK DELAY



Finally, Figure 5.4 compares average daily Heavy Duty Truck delays, which shows an improvement of nearly 21 percent compared to the Baseline. This is an important statistic given the Plan's emphasis on the logistics industry and its importance to the regional economy.

Exhibits 5.1, 5.2, and 5.3 depict regional PM peak (3 p.m. to 7 p.m.) freeway speeds for Base Year 2003, Baseline in 2035, and Plan in 2035, respectively.

ACCESSIBILITY

Accessibility measures how well the transportation system provides people access to opportunities. Opportunities can include jobs, education, medical care, recreation, shopping, or other activities that help improve people's lives. For the 2008 RTP, accessibility is defined as the percentage of the population who can travel between work and home within 45 minutes during the peak period. Access to employment is used as a reasonable proxy for access to all opportunities, since work trips make up a large percentage of total trips during commute periods. For people traveling by automobiles this is defined as those who travel during the afternoon commute period, and for transit users both the AM and PM commute periods are included to facilitate the modeling of transit trips.

EXHIBIT 5.1 BASE YEAR 2003 FREEWAY SPEED | PM PEAK

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

EXHIBIT 5.2 BASELINE 2035 FREEWAY SPEED I PM PEAK

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

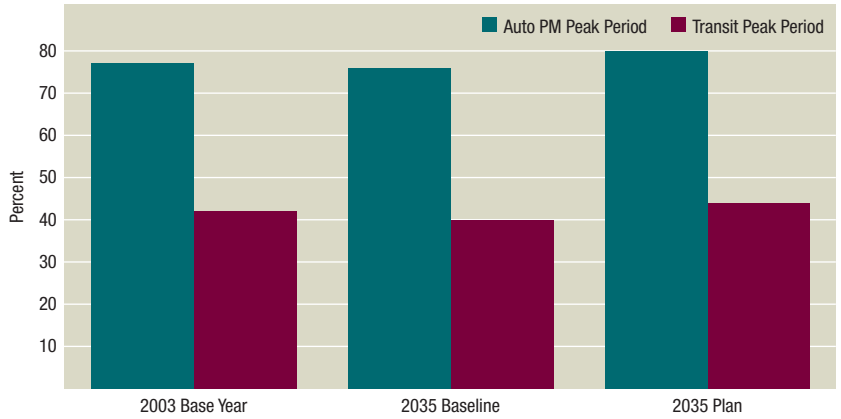
EXHIBIT 5.3 PLAN 2035 FREEWAY SPEED | PM PEAK

Source: Southern California Association of Governments, ESRI StreetMap USA, Teleatlas

Figure 5.5 compares the Plan to Base Year and Baseline, and presents the percent of work trips completed within 45 minutes for both automobiles and transit. The figure shows that automobile accessibility stays relatively constant over the 2035 baseline period at around 76 percent, but the Plan improves automobile accessibility to around 80 percent.

Transit accessibility is projected to decline from 42 percent currently to around 40 percent under the 2035 Baseline scenario. However, it will improve slightly from to 44 percent under the Plan. This improvement in accessibility is primarily due to the Land Use Integration strategy, which intensifies densities and focuses development close to work and along major transit corridors.

FIGURE 5.5 AUTO AND TRANSIT ACCESSIBILITY



RELIABILITY

The reliability outcome reflects the degree to which travelers experience variations in their trip times from day to day. As such, it captures the relative predictability of the public's travel time. Unlike mobility (which measures how quickly the transportation system is moving people) and accessibility (which addresses how good the system is in providing access to opportunities, primarily jobs), reliability focuses on how much mobility and accessibility vary from day to day.

The reliability measure is calculated by using the statistical concept of standard deviation. The indicator is computed by dividing the standard deviation of travel time for a given trip by the average travel time of that trip, measured over many days and weeks. Table 5.2 shows how a traveler can use this indicator depending on the importance of arriving on time. For example, if a person's morning commute takes on average 26 minutes, but varies 15 percent from day to day, then he or she must plan the trip to account for additional time. Table 5.2 also shows that if this person wants to be 99 percent confident that he or she arrives on time, he or she must plan for 38 minutes of travel instead of 26.

TABLE 5.2 VARIABILITY OF TRAVEL TIME: HYPOTHETICAL ILLUSTRATION

Trip	Time Period	Average Travel Time	Variability of Travel Time	Travel Time Based on Level of Confidence of Arriving on Time		
				70%	95%	99%
Hypothetical Commute Trip	AM Peak	26 min.	15%	30 min.	34 min.	38 min.
	PM Peak	32 min.	25%	40 min.	48 min.	56 min.
	Off Peak	20 min.	10%	22 min.	24 min.	26 min.

This indicator is relatively new in transportation planning and operations, and exact models to compute and forecast it are not available. However, by using existing travel time data and research results, it is possible to estimate the Plan's impact on reliability. Table 5.3 presents these results, which reflect the benefits derived from the investments that help respond more quickly and effectively to traffic accidents or provide traveler information. These improvements are conservatively projected in the 10 percent range. However, it is critical to continue to monitor this measure and improve the tools to forecast the impacts of such investments in future SCAG planning cycles.

TABLE 5.3 ESTIMATED IMPROVEMENTS IN TRAVEL TIME RELIABILITY

Peak Period	Hour	Base Year 2005 Average Percent Variability of Travel Time	Plan 2035 Average Percent Variability of Travel Time
Morning Peak Period (6 am to 9 am)	6 am to 7 am	16%	14%
	7 am to 8 am	22%	20%
	8 am to 9 am	23%	21%
Afternoon Peak Period (3 pm to 7 pm)	3 pm to 4 pm	25%	23%
	4 pm to 5 pm	26%	23%
	5 pm to 6 pm	28%	25%
	6 pm to 7 pm	25%	23%

Source: Caltrans

PRODUCTIVITY

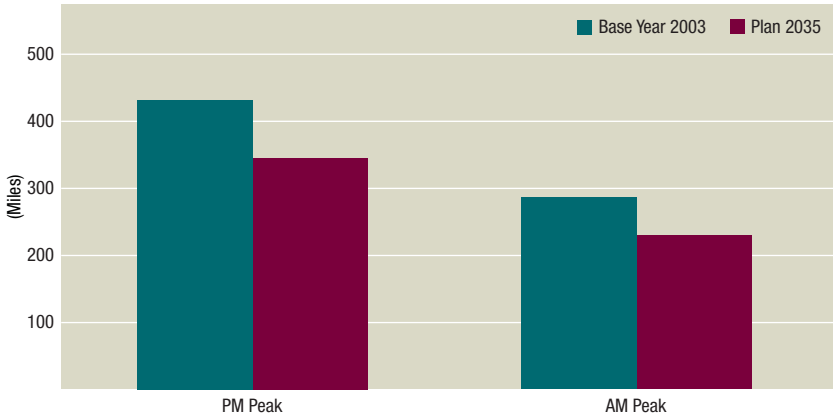
The productivity outcome reflects the degree to which the transportation system performs during peak demand conditions. It is a system efficiency measure. The productivity indicator is defined as the percent utilization during peak demand conditions.

As an example, freeways are typically designed to carry 2,000 vehicles per lane per hour. However, in many locations on the Region's freeway system, vehicles weaving and merging in and out of traffic cause bottlenecks, which lead to significant reductions in capacity utilization. Again, using freeways as an example, the carrying capacity of a freeway lane can drop by as much as 50 percent, allowing only 1,000 vehicles per hour to pass. In effect, the system "loses" capacity, which can be estimated in terms of lost lane-miles.

Figure 5.6 summarizes the current estimate for productivity losses on the Region's freeway system and the expected improvements due to Plan investments. Maximizing the system's productivity is a critical goal of this RTP and the overall system management approach aims to recapture lost productivity. The incremental investment of over $2 billion to implement advanced operational strategies on our freeways and arterials are projected to recapture 20 percent of the lost productivity. These projections are based on recent studies indicating that investments in ramp metering, arterial signal coordination, traveler information, and incident management can achieve such improvements.

The Plan improves productivity by committing to investments in state highway operations discussed in Chapter IV. Transit productivity will also improve through increased ridership, which maximizes the number of seats occupied during peak demand conditions.

FIGURE 5.6 HIGHWAY SYSTEM PRODUCTIVITY (LOST LANE-MILES)



SAFETY

Improving safety by minimizing accidents are a critical outcome of the RTP. The safety indicators used to measure and track safety-related performance are:

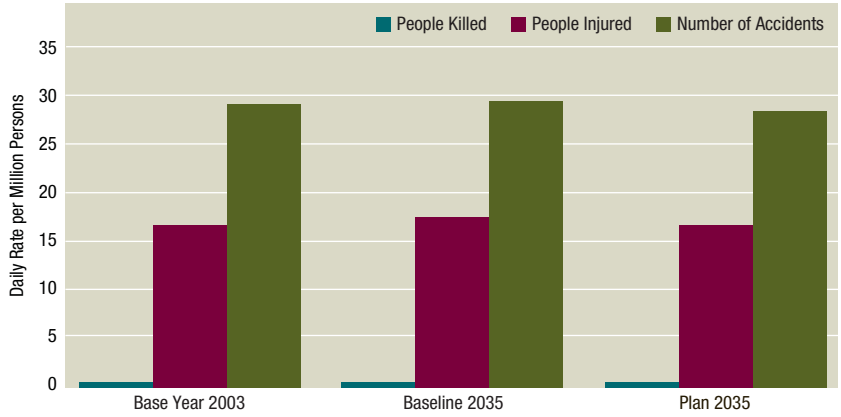
- Fatalities per million persons
- Injuries per million persons

- Property damage accidents per million persons

State and regional transportation agencies dedicate funds to projects that specifically address safety deficiencies. However, it is not possible to predict the reduction in accident rates resulting from these investments. Hence, the safety results presented here are estimated based on current accident rate trends for the different modes applied to projected levels of system use by mode. They represent a conservative estimate for safety benefits.

Figure 5.7 compares safety indicators for the Base Year, Baseline, and Plan scenarios. The overall improvement is estimated based on overall accident rates by mode (e.g., auto, bus, and rail) and facility (e.g., freeways and principal arterials).

FIGURE 5.7 ACCIDENT RATES



SUSTAINABILITY

A transportation system is sustainable if it maintains its overall performance over time with the same costs for its users. Sustainability, therefore, reflects how our decisions today affect future generations. The indicator for sustainability is the total inflation-adjusted cost per capita to maintain overall system performance at current conditions.

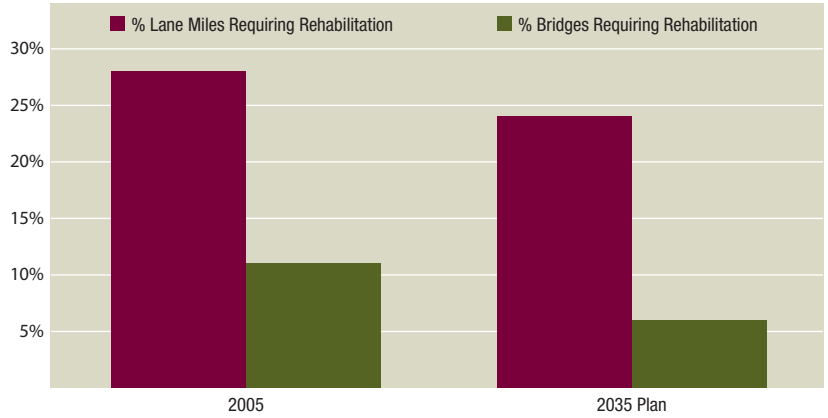
The performance measures presented in this chapter show that the planned transportation system in 2035 will perform better in some cases (e.g., safety, preservation) and worse in others (e.g., delay, per capita) compared to today. Moreover, the overall cost of the Plan represents a significant increase in nominal costs based on increased taxes to fund additional regional projects discussed in Chapter III as well as incremental preservation and operations investments.

PRESERVATION

The preservation outcome reflects how well the Region is taking care of its multi-modal transportation infrastructure. As discussed in Chapter II of this document, deferred maintenance investments end up costing much more in the future as the conditions of our assets (e.g., pavement) deteriorate.

Figure 5.8 shows the benefits of the additional expenditures dedicated in this RTP over and beyond the historical trends. As of 2005, 28 and 11 percent of the SCAG Region's roadways and bridges required rehabilitation, which are more intensive and expensive projects. As a result of the incremental investments, these percentages are projected to fall to 24 percent for roadways and 6 percent for bridges. Similar improvements are expected for regional arterials as well.

FIGURE 5.8 PRESERVATION IMPROVEMENTS



COST-EFFECTIVENESS

Cost-effectiveness reflects the degree to which transportation expenditures in the Plan yield benefits that the transportation users experience. It attempts to measure how much "bang for the buck" is received from the Plan. The indicator for cost-effectiveness is the benefit-cost ratio. Benefits are divided into several categories as follows:

- Delay savings
- Safety improvements
- Air quality improvements
- Reductions in vehicle operating costs

For each of these categories, models are used to estimate the benefits of the Plan compared to Baseline. The benefits are converted into dollars, added together, and divided by the total incremental costs of the Plan's transportation improvements. Table 5.4 summarizes the results of the benefit-cost analysis.

TABLE 5.4 SCAG REGIONAL PERFORMANCE ANALYSIS BENEFIT/COST RESULTS

Project	Value of $1 Invested
2008 RTP	$2.30

SCAG's 2008 RTP provides a $2.30 return for every dollar invested. For this analysis, all benefits and costs are expressed in year 2007 dollars. Benefits are estimated through the year 2045. The user benefits are estimated using methodologies consistent with the Cal B/C model adjusted to incorporate SCAG's regional travel demand model output. Costs include incremental public expenditures over the RTP time period.

While $2.30 return on every dollar invested is an excellent return on investment, it is lower than the $3.08 reported in the 2004 RTP. Several factors influence this outcome. First, project costs have skyrocketed over the past several years, negatively impacting the rate of return. Second, this Plan proposes significant investment increases in strategies that do not easily translate into readily quantifiable benefits based on currently available tools, namely SCAG's transportation demand model. Such investment categories include system preservation, system operation and management, and investments that are not captured in SCAG's demand model, such as rail improvements associated with goods movement.

Mobility Benefits Attributable to the Land-Use Strategies

The Compass Blueprint Integrated Land Use Strategy is a primary instrument used to achieve the RTP performance goals through the integration of land use and transportation investment decision-making. The comparison of the transportation modeling results between the Baseline Growth Forecast Alternative and the Policy Growth Forecast Alternative isolates the transportation benefits due to regional land use policy. The following charts clearly illustrate that the regional land use strategy of focusing development in existing and

emerging centers, along transportation corridors, promoting transit-oriented and mixed use development and improving regional jobs-housing balance results in significant mobility benefits.

Compared to the Baseline growth forecast, the adopted land use strategy reduces travel by over 20 million vehicle miles traveled per day (Figure 5.9), eliminates about 0.9 million hours of travel per day (Figure 5.10), and reduces daily congestion delay by 0.5 million hours (Figure 5.11).

4D LAND USE/TRANSPORTATION MODEL ANALYSIS

The 2008 RTP Policy Growth Alternative is built on the understanding that development, planned synergistically with the transportation system, can have a dramatic effect on travel behavior and VMT. The transportation modeling summarized above is consistent with this concept.

Additional analysis found that a simple proxy, such as residential density, land-use diversity and urban design, shows a very strong relationship with travel propensity. Specifically, commuting accounts for about 25% of household VMT, indicating that non-work travel is the primary source of household VMT. With a relationship that is closely tied to land-use, SCAG sought to quantify the characteristics of environment to explain why travel behavior may differ in an urban versus a suburban setting. Recent research on the topic proposes a framework consisting of the "3Ds" – Density, Diversity and Design.

- Density: the general concentration and proximity of activities, applied to both residential or employment density.
- Diversity: the degree to which different land-use activities are intermingled, or "mixed", as well as the balance of that mix.
- Design: the packaging of density and diversity, in terms of attractiveness, functionality and connectivity for pedestrians.

SCAG incorporated a fourth "D", Regional Transit Accessibility, originally used in the EPA's Smart Growth Index (SGI) Model. This measure of the relationship between travel behavior and land-use is a critical given the Plan Alternative's focus of future development in activity centers, around new and existing transit stations, and in nodes along corridors.

A post-processor approach modeled these variables to individual TAZs in the Plan and Baseline Scenarios. Since the SCAG regional model is (as with all 4-step models) insensitive to land-use features below the aggregation level of the TAZ, the 4D model was used to estimate the incremental benefit attributable to local land use. This process concluded that the 4D model is capable of yielding an additional reduction of 8.6 million daily VMT region-wide above and beyond the 19 million reduction modeled by SCAG's 4-step transportation model.

Though this analysis and its benefits have not been incorporated into the 2008 RTP Performance Results, SCAG will continue to work with local, state and federal stakeholders to further develop its 4D approach and document its benefits for use in subsequent regional transportation plans. Additional information can be found in Appendix C of the Integrated Growth Forecast and Regional Land-Use Policies Report.

FIGURE 5.9 DAILY VMT WITH AND WITHOUT LAND USE STRATEGY

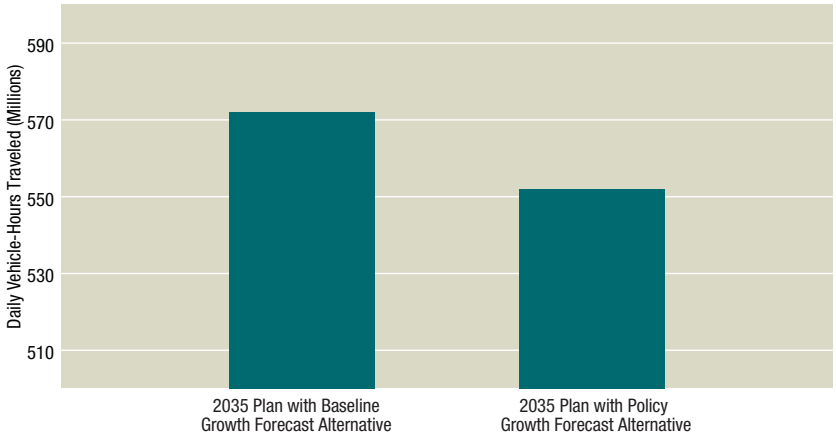


FIGURE 5.10 DAILY VHT WITH AND WITHOUT LAND USE STRATEGY

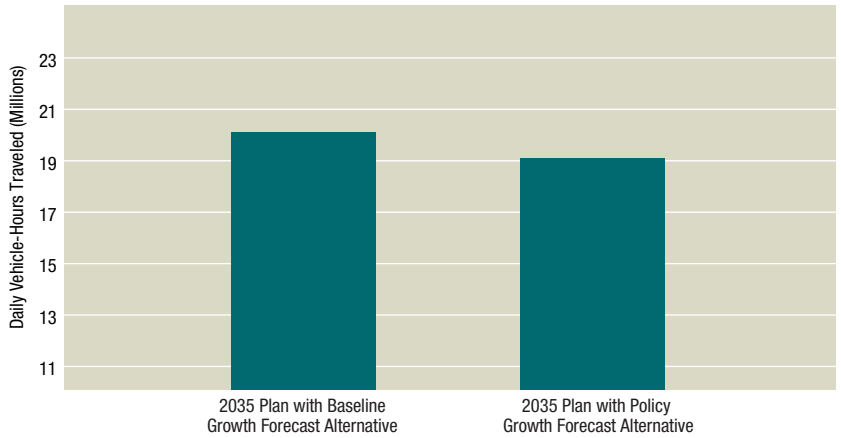
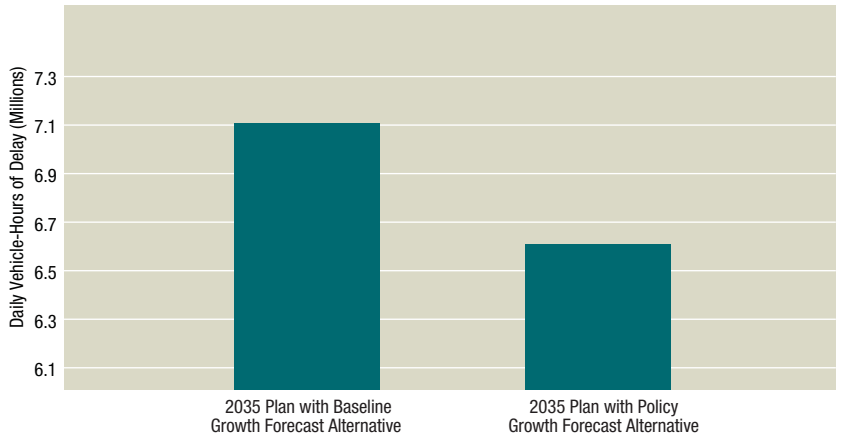


FIGURE 5.11 DAILY DELAY WITH AND WITHOUT LAND USE STRATEGY



Transportation Conformity Analysis

Transportation conformity is required under the federal Clean Air Act (CAA) to ensure that federally supported highway and transit project activities conform to the purpose of the SIP[1]. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. Conformity applies to areas that are designated non-attainment, and those re-designated to attainment after 1990 ("maintenance areas") for the following transportation-related criteria pollutants: ozone, particulate matter (PM2.5 and PM10), carbon monoxide (CO), and nitrogen dioxide (NO2).

NON-ATTAINMENT/MAINTENANCE AREAS

The boundaries of the federal non-attainment/maintenance areas in the SCAG region are:

- Ventura County portion of the South Central Coast Air Basin (SCCAB) — The entire county is a non-attainment area for ozone.
- South Coast Air Basin (SCAB) — The entire basin is a non-attainment or maintenance area for NO2, CO, PM10, PM2.5, and ozone.
- Antelope Valley and Victor Valley portion of Mojave Desert Air Basin (MDAB) — This is a non-attainment area for ozone.
- San Bernardino County portion of MDAB.
  - Searles Valley (situated in the NW part of the county) is non-attainment for PM10.
  - San Bernardino County (excluding the Searles Valley area) portion of MDAB is a non-attainment area for PM10.
- The Riverside County portion of Salton Sea Air Basin (SSAB) — The entire Riverside County portion of SSAB (Coachella Valley) is a non-attainment area for PM10 and ozone.

[1] To comply with the CAA in achieving the NAAQS, the ARB develops SIPs for federal non-attainment and maintenance areas. In California, SIP development is a joint effort of the local air agencies and ARB working with federal, state, and local agencies (including the MPOs). Local Air Quality Management Plans (AQMPs) are prepared in response to federal and state requirements.

- The Imperial County portion of SSAB - The entire Imperial County portion of SSAB is designated as non-attainment for ozone and PM10.

CONFORMITY TESTS

The 2008 RTP must pass the following tests and analyses to meet the requirements for a positive conformity finding:

- Regional Emission Analysis;
- Timely Implementation of Transportation Control Measures (TCMs) Analysis;
- Financial Constraint Analysis;
- Interagency Consultation and Public Involvement Analysis.

REGIONAL EMISSIONS ANALYSIS

Regional emissions analyses, by non-attainment area and by pollutant, compare on-road emissions to the applicable on-road emissions budgets in the SIPs for the SCAG Region. The applicable emissions budgets are those approved and found to be adequate for conformity determination by the U.S. EPA. In the absence of applicable emissions budgets, the regional emission tests for conformity finding are based on either a build/no-build or less-than Base-Year scenario.

Due to recent litigation relative to U.S EPA's Eight-hour Ozone Phase 2 Rule, EPA has instructed ARB to revise the established method of demonstrating Reasonable Further Progress (RFP) in ozone non-attainment areas that utilize reductions from other areas to demonstrate attainment (e.g., upwind areas). In the SCAG region, such areas include the Ventura County portion of the SCCAB, the Western MDAB (Antelope Valley and a portion of San Bernardino County), and the Coachella Valley portion of the SSAB. Therefore, at this time, there are no AQMPs or SIPs and, thus, no 8-hour ozone transportation emission budgets for these areas. SCAG has worked closely with the ARB and EPA to resolve this issue. As agreed upon by ARB and EPA, ARB will adopt

early progress plans (i.e., emissions inventories and transportation emission budgets) for areas that need upwind reductions to show RFP. The early progress plans will be the vehicle to establish transportation emission budgets while EPA decides how to respond to the RFP issue raised by the litigation. ARB plans to release the early action plans for public review in December 2007 for adoption in January 2008. ARB and SCAG have requested that EPA parallel process their review of the transportation emission budgets to expedite approval. As instructed by ARB, the Draft 2008 RTP conformity analysis uses the transportation activity data provided to ARB as the basis for the emission budgets for these areas.

TIMELY IMPLEMENTATION OF TCMS ANALYSIS

This conformity test requires Transportation Control Measures (TCM) projects subject to reporting be fully funded and on schedule. In the SCAG Region, there are two areas for which SIPs contain TCMs: the ozone AQMPs/SIPs for the SCAB and for the Ventura County portion of SCCAB. SCAG works with

the CTCs to ensure TCMs are on schedule or that steps are being taken to overcome obstacles.

FINANCIAL CONSTRAINT ANALYSIS

The 2008 RTP is financially constrained and is financed by federal, state, local and private sources. Detailed information on the financial analysis is included in Chapter IV.

INTERAGENCY CONSULTATION AND PUBLIC INVOLVEMENT

Throughout its development, the 2008 RTP has been discussed at meetings of various policy committees, working groups (including the Transportation Conformity Working Group), task forces, and technical advisory committees. SCAG's Transportation Conformity Working Group has served as a forum for interagency consultation, and additionally, there were many ad-hoc meetings held between the involved agencies for this purpose. SCAG's RTP public outreach effort is documented in a separate Public Participation report. Continued interagency consultation and public involvement will occur throughout the public review process.

DRAFT CONFORMITY ANALYSIS

The draft conformity analysis indicates a positive conformity finding for the Draft 2008 RTP. The formal conformity finding will be based on the RTP as prepared for adoption. The detailed transportation conformity analyses for the Draft 2008 RTP are included in the Draft 2008 RTP Conformity Report.

Environmental Justice

The environmental justice movement stems from Title VI of the Civil Rights Act of 1964. This title declares it to be the policy of the United States that discrimination on the grounds of race, color, or national origin shall not occur in connection with programs and activities receiving federal financial assistance, and authorizes and directs the appropriate federal departments and agencies to take action to carry out this policy. Title VI of the Civil Rights Act of 1964 provides a significant means by which the public can seek greater accountability from transportation agencies. Title VI bars intentional discrimination, but also unjustified disparate impact discrimination.[2]

SCAG'S ENVIRONMENTAL JUSTICE POLICY & PROGRAM

Environmental Justice is an integral part of the planning process, which must be considered in all phases of planning. SCAG's environmental justice program includes two main elements: public outreach and analysis.

[2] CommunityLink 21, Regional Transportation Plan: Equity and Accessibility Performance Indicators http://www.fhwa.dot.gov/environment/ejustice/case/case4.htm

ENVIRONMENTAL JUSTICE PUBLIC OUTREACH

Public outreach efforts are intended to ensure that all members of the public have an opportunity to participate meaningfully in the planning process. SCAG's public outreach efforts include the following:

- Compliance Procedure for Environmental Justice in the Transportation Planning Process - In October 2000, SCAG released the Compliance Procedure for Environmental Justice in the Transportation Planning Process, which provided a detailed description of SCAG's public outreach activities. Since its publication, SCAG staff has utilized this guidance document to ensure that it 1) includes traditionally unrepresented groups early and throughout the planning process; 2) carefully examines performance measures to determine any inequities of the RTP on any group; 3) and follows the self-evaluation procedure for public outreach and environmental justice analysis programs.
- Public Workshops – Workshops are held throughout the planning process and target minority and low-income communities throughout the region. Follow-up workshops are held with groups that want to stay involved throughout the planning cycle.
- Presentations – SCAG also conducts presentations upon request to a variety of groups. These include Chambers of Commerce, community-based organizations, non-profit groups, etc. Generally, these presentations provide an overview of SCAG and its function as an MPO.
- Website Dissemination - Another method of public outreach is electronic dissemination of information. SCAG's RTP and the EJ program have individual webpages within SCAG's website dedicated to each.[3]
- Documentation - Following each contact with the public, every comment and concern is recorded in writing regardless of source. Each comment is logged, categorized, and submitted to SCAG planning staff for review and consideration.

[3] RTP Website:http://scag.ca.gov/rtp2008/ EJ Website: http://scag.ca.gov/environment/ej.htm

TECHNICAL ANALYSIS

SCAG's equity analysis has two major components: one focusing on the distribution of environmental impacts, and one involving examination of performance measures to determine any disproportionate negative impacts. The distribution of impacts is assessed on certain minority and income groups.

Executive Order 12898 and the DOT and FHWA Orders on Environmental Justice define "minority" as persons belonging to any of the following groups, as well as "other" categories that are based on self-identification of individuals in the U.S. Census[4]: Black, Hispanic, Asian, American Indian and Alaskan Native, and Native Hawaiian or Other Pacific Islander. Other demographic populations considered in the RTP EJ Analysis include various age groups, specifically the elderly population (over 65 years of age), and persons who are disabled or have limited mobility.

Identifying low-income and minority populations is necessary both for conducting effective public participation and for assessing the distribution of benefits and burdens of transportation plans and projects. For the purposes of this analysis, SCAG focused on all low-income groups and minority populations. The minority population in the SCAG region comprises over 70% of the population. The predominant minority groups are Hispanics and Asian/Pacific Islanders, which combine to account for 66% of the total minority population within the SCAG region. Poverty level is a federally established income guideline used to define persons who are economically disadvantaged, as defined by the U.S. Department of Health & Human Services guidelines.[5] The poverty level applicable to the SCAG region is chosen on the basis of regional average household size for the census year. For example, for a regional mean of 2.98 persons - rounded to 3 - per household, the threshold would consist of the sum of the value for the first person plus two additional people. The household counts in each income range are then used to determine the number and percentage of households in each census tract below the poverty

[4] http://www.fhwa.dot.gov/environment/ej2000.htm

[5] White House Council on Environmental Quality (CEQ). Environmental Justice Guidance Under the National Environmental Policy Act, December 1997.

level. In 2007, a family of three earning less than $17,170 was classified as living in poverty.

In addition to complying with federal guidance, SCAG also conducts income equity analyses based on five income quintiles. A quintile, by definition, is a category into which 20% of the ranked population falls. For each new analysis, SCAG defines regional income quintiles based on the most recent census data on household income. Once the income quintiles are established, the incidence of benefits and costs can be estimated and compared across these income categories. Table 5.5 lists the demographic categories used in SCAG's EJ analysis.

TABLE 5.5 DEMOGRAPHIC CATEGORIES USED IN SCAG ENVIRONMENTAL JUSTICE ANALYSIS

Ethnic/Racial/Other Categories (persons)
White (Non-Hispanic)
African-American
Native American
Asian/Pacific Islander
Hispanic (Latino)
Other
Disabled/Mobility Limited
Over 65
Income Categories (households)
Below Poverty Level
100% - 150% of Poverty Level
150% - 200% of Poverty Level
Income Quintile 1 (lowest)
Income Quintile 2
Income Quintile 3
Income Quintile 4
Income Quintile 5

In the development of the Plan, SCAG utilized a number of performance measures designed to assess the overall equity.

- Accessibility
- Cost
- Environmental Impact Analyses
- Plan Expenditures/Investments

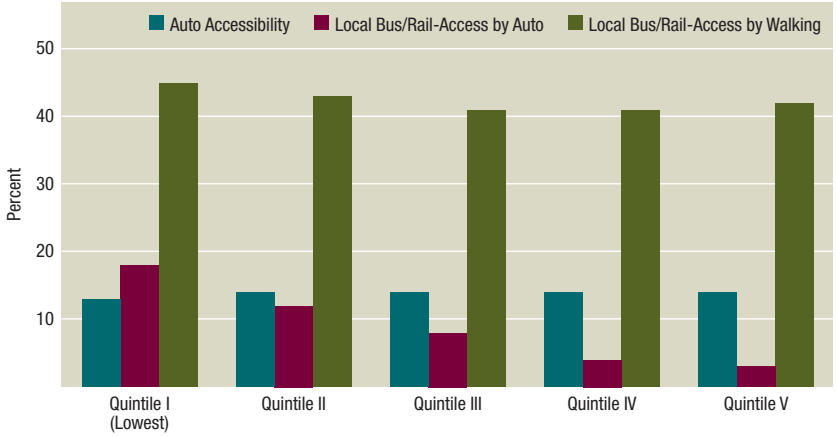
- Travel Distance Reductions
- Time Savings

Accessibility to Employment Services

Accessibility is a foundation for social and economic interactions. As an indicator, accessibility is measured by the spatial distribution of potential destinations, the ease of reaching each destination, and the magnitude, quality and character of the activities at the destination sites. Travel costs are central: the lower the costs of travel in time and money terms, the more places that can be reached within a certain budget and, thus, the greater the accessibility. Destination choice is equally crucial: the more destinations and the more varied the destinations, the higher the level of accessibility.[6]

Figure 5.12 shows the percentage improvement between Baseline and Plan. The results indicate that accessibility to jobs by auto will remain relatively constant for all income groups. Improvement in accessibility by transit is higher for the lower-income groups. All income groups should benefit from improvements in accessibility due to the 2008 RTP. Thus, the results indicate that disproportionate impacts between income groups, in terms of accessibility in the region to employment services by automobile or by transit, are not anticipated as a result of the Plan.

FIGURE 5.12 COMPARISON OF ACCESSIBILITY IMPROVEMENTS BY TRAVEL MODE FOR INCOME QUINTILES



Plan Expenditures/Investments

SCAG reports expenditure distribution in several ways. First, SCAG estimates the share of total RTP expenditures allocated to each category of household income. This is done by totaling expenditures on each type of mode (bus, HOV lanes, commuter/high-speed rail, highways/arterials, and light/heavy rail). These expenditures are then allocated to income categories based on each income group's tendency to use these modes. Since there are a number of privately funded transportation projects in the SCAG region, private and public projects are considered separately.[7]

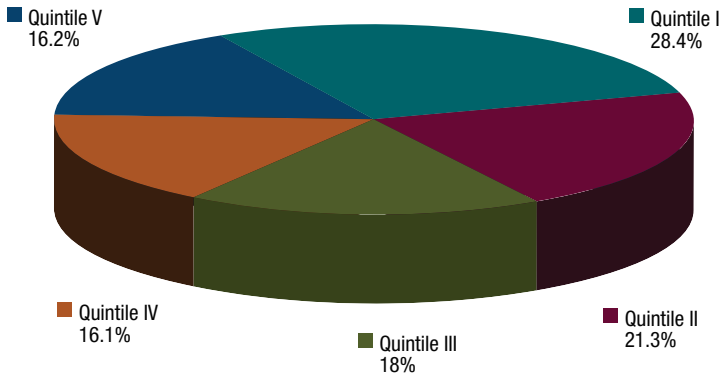
The 2008 RTP utilized a benefit assessment method that considered the extent that various socioeconomic groups were receiving value from existing and funded transportation investments. Figure 5.13 presents the findings for percent of total expenditures, which looks at the raw dollars and compares the amounts spent on low-income and high-income persons. Approximately 28 percent of Plan expenditures will be allocated to the lowest quintile group,

[6] CommunityLink 21, Regional Transportation Plan: Equity and Accessibility Performance Indicators http://www.fhwa.dot.gov/environment/ejustice/case/case4.htm

[7] Caltrans. Desktop Guide: Environmental Justice in Transportation Planning Investments. January 2003.

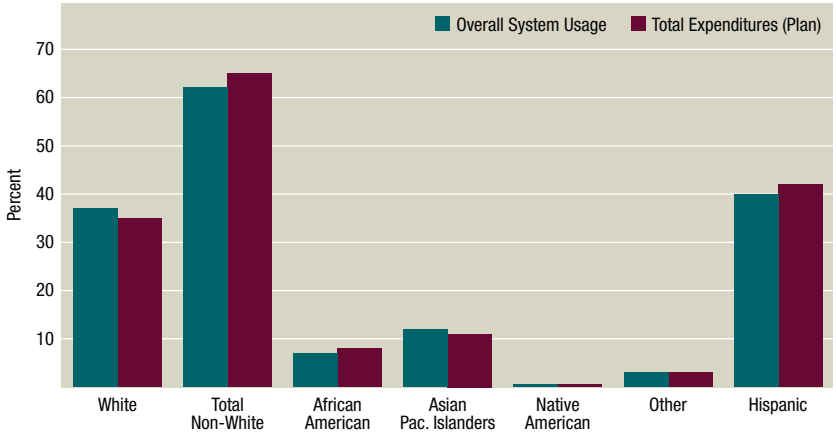
while 16 percent will be invested for the highest income category (Quintile V). This can be explained by a number of factors, including the expression of costs in nominal dollars in the 2008 RTP (as opposed to constant dollars in the 2004 RTP) and high transit operating costs.

FIGURE 5.13 PLAN EXPENDITURES BY INCOME GROUP



Expenditure distribution was also compared to various ethnic/racial categories. The current analysis reveals that under the 2008 RTP, Plan expenditures will be distributed more equitably on the basis of system usage by ethnic/racial groups. As shown in Figure 5.14, for most ethnic and racial categories, the shares of Plan investments are similar to the shares of system usage, averaging a 1 percent difference in expenditure versus overall usage for each ethnic group.

FIGURE 5.14 PLAN EXPENDITURES BY ETHNIC/RACIAL CATEGORY

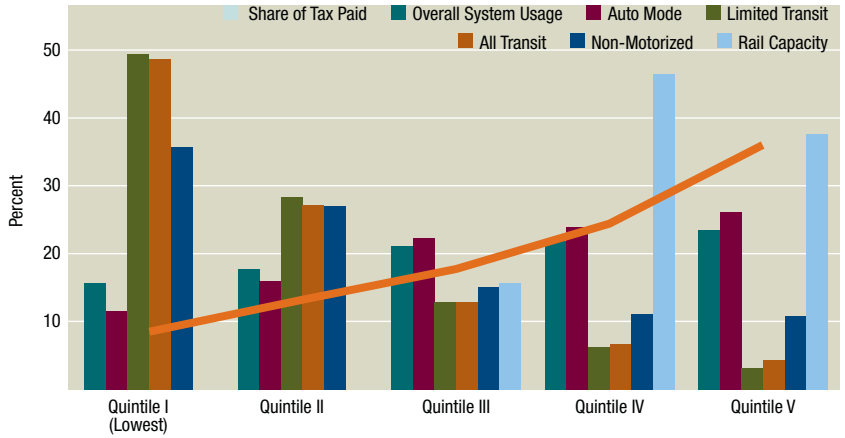


Costs (Taxes Paid)

Costs are evaluated by examining the taxes – sales, gasoline, and income – that fund most transportation expenditures, and how these tax burdens fall on various populations. The underlying concept is that the share of benefits should be roughly in line with the share of costs paid.

The 2008 RTP environmental justice analysis performed a comparative analysis of the amount of taxes (sales, gasoline, and income) paid by five income groups. Figure 5.15 indicates that tax burdens are projected to fall heavily on higher-income groups. The three lower quintile groups combined for a total of 40 percent of taxes paid, while the highest quintile group (Quintile V), accounted for 36 percent of overall taxes paid. Thus, those with limited financial means are not expected to pay a disproportionate amount of overall taxes.

FIGURE 5.15 SHARE OF TRANSPORTATION USAGE FOR INCOME QUINTILES*



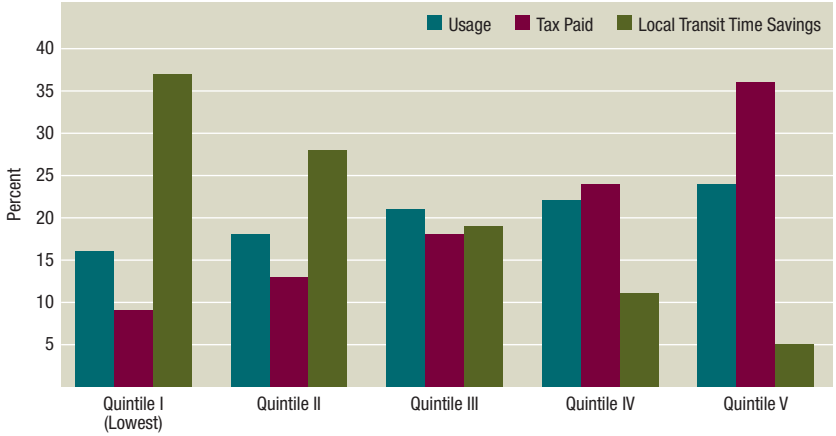
*The contents in this chart use both work and non-work trips; Rail capacity uses only work trip data
*Share of Tax Paid includes sales and gasoline taxes.

Distribution of Time Savings

This measures the average travel time for all trip purposes. SCAG assesses the distribution of travel time savings that are expected to result from the Plan's implementation. SCAG conducted this analysis for automobile, transit, and low-cost transit (a subset of transit). These travel time savings by group are reported as a proportion of the total travel time savings for each mode.

Figure 5.16 shows the analysis results for low-cost transit modes, such as local bus and urban rail, for the five income groups. The results in the 2008 analysis reveal that transit users in the two lowest income quintiles are projected to pay just over 20 percent of total taxes collected in the region, but will enjoy over 60 percent of the time savings. The two highest income quintiles will pay a larger share of taxes (61 percent) than they receive in time savings benefits for travel by local transit (16 percent), although they will account for almost 50 percent of total usage. Thus, the findings suggest that those in the higher income groups (Quintile IV and Quintile V) are willing to pay more for their transit time savings.

FIGURE 5.16 SHARE OF SYSTEM USAGE, TAX PAID & LOCAL TRANSIT TRAVEL TIME SAVINGS



Results are also shown for trips made by automobile. Figure 5.17 shows that the share of time savings is roughly comparable to the share of taxes paid and transportation system usage. The results indicate that the lowest quintile group will have the least amount of benefit with auto travel time accounting for 11 percent of auto time savings, while the highest quintile group will benefit the most. However, that benefit comes at a steep price, as the highest two income quintiles pay for 60 percent of total taxes.

FIGURE 5.17 SHARE OF SYSTEM USAGE, TAX PAID & AUTO TRAVEL TIME SAVINGS

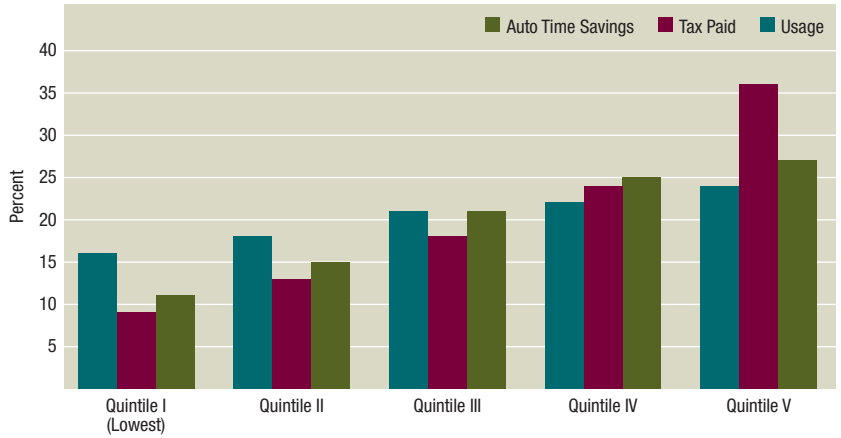
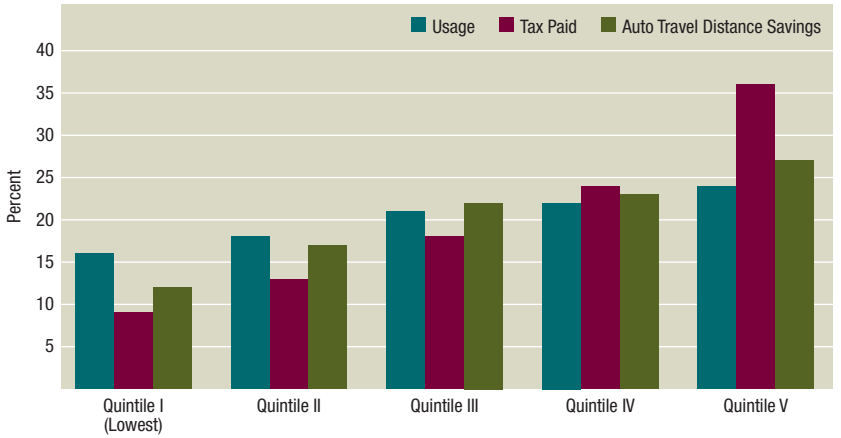


FIGURE 5.18 SHARE OF SYSTEM USAGE, TAX PAID & AUTO TRAVEL DISTANCE SAVINGS



Travel Distance Reductions

Another way of estimating benefits is to calculate savings in terms of person-miles traveled (PMT). These results indicate the share of driving distance savings.

Figure 5.18 shows that the share of auto travel distance savings is generally comparable to the share of taxes paid and transportation system usage between all income groups. Again, this is excluding households belonging in Quintile V; the taxes paid by the highest income group are anticipated to exceed their share of benefits. The lowest quintile group is expected to have the least amount of benefits, accounting for 12 percent of auto travel distance savings. The highest quintile group is expected to receive the most benefit.

Environmental Impacts

Transportation projects can have both a positive or negative impact on the environment. On the one hand, investments can cause travelers to shift to less polluting modes (e.g., bus, train, carpooling, or commuter rail). On the other hand, investments that increase traffic on a particular facility usually degrade air quality in the immediate vicinity of that facility.[8]

Air Pollutant Emissions

Minorities and low-income groups may be particularly vulnerable to the effects of air pollution. SCAG's analysis is based on emissions estimates for pollutants that have localized health effects: carbon monoxide (CO) and particulate matter (PM). Analysis was also conducted for PM exhaust emissions from heavy-duty vehicles, an indicator for diesel toxic air contaminants. The results were computed based on the average emissions at the Transportion Analysis Zone level and weighted according to the population of each ethnic

[8] Caltrans. *Desktop Guide: Environmental Justice in Transportation Planning Investments*. January 2003.

or income group in that TAZ. This analysis focuses on air emissions and noise impacts generated from aviation and highway activity.

It is important to note that total emissions of all pollutants in the region will decrease compared to existing conditions with or without the Plan, due to the combination of measures being taken to meet air quality standards. Since the Plan must demonstrate conformity with regional air quality management plans that call for reductions in emissions of air pollutants, the Plan itself will likewise result in reductions of pollutant emissions. This is generally because the Plan investments will alleviate roadway congestion and provide a greater range of alternatives to the use of a car. The following analysis, however, is based on a comparison of Plan to Baseline conditions, rather than a comparison of Plan to current conditions.

Since ambient pollutant concentration levels that are directly linked to localized emissions could not be easily estimated, the geographic emissions distribution analysis presented here focuses on pollutants that tend to have localized effects which are generally proportionate to emissions – carbon monoxide (CO) and fine particulate matter (PM10). The analysis does not cover pollutants that do not have localized effects proportionate to emissions, but are regionally distributed as a result of chemical interactions, photochemical reactions and meteorology (VOC, NOx, and SOx).

In addition, this methodology assumes that all residents in a given TAZ are equally exposed. Generally both CO and PM10 tend to impact those located closest to the source of emissions. Thus, in a TAZ containing a roadway, those closest to the roadway would experience greater emissions and potential health impacts than those located further away. This differential as it might exist within TAZs is not addressed by this analysis; only differences between the aggregate demographic totals of different TAZs are addressed. Notwithstanding these assumptions, the methodology presents a reasonable gross measure of air quality impacts of mobile sources in the region.

FIGURE 5.19 PERCENTAGE CHANGE IN 2035 POLLUTANT EMISSIONS BY INCOME CATEGORY (PLAN VS. BASELINE)

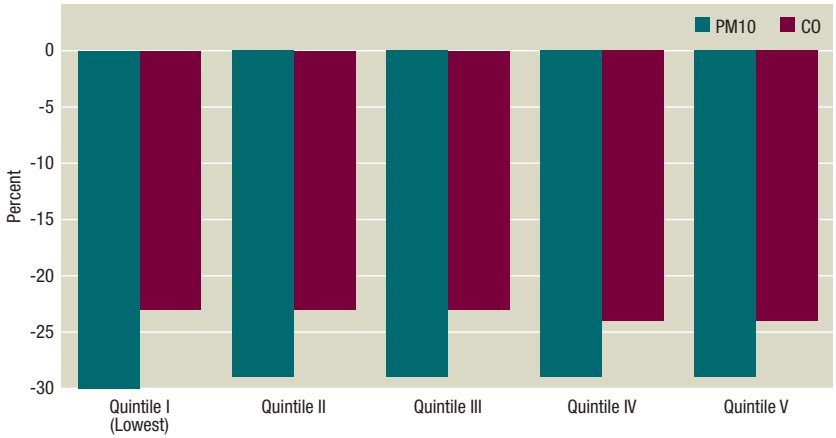
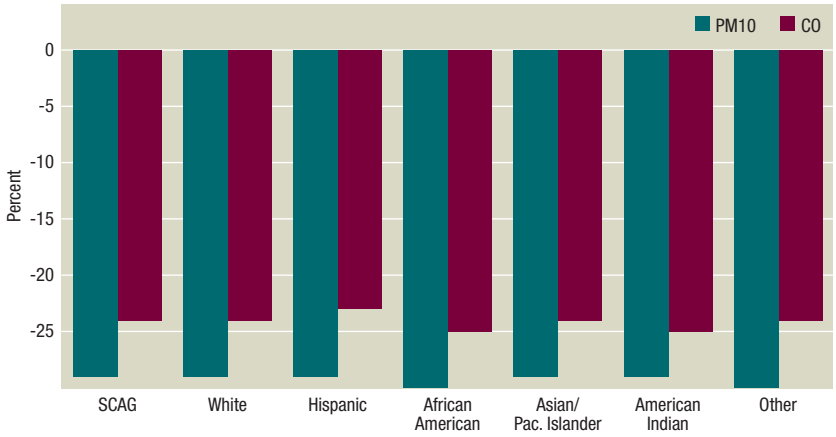


FIGURE 5.20 PERCENTAGE CHANGE IN 2035 POLLUTANT EMISSIONS BY ETHNIC/RACIAL CATEGORY (PLAN VS. BASELINE)



Overall, the region as a whole will generally experience an improvement in air quality via reductions in transportation-related emissions. However, emissions of CO and PM10 in some TAZ's will increase under the Plan compared

to the Baseline conditions. This analysis did not show that there would be a disproportionate impact on minority or low-income populations (see Figures 5.19 and 5.20).

Aviation Noise Impacts

The SCAG Region supports the nation's largest regional airport system in terms of number of airports and aircraft operations, operating in a very complex airspace environment. One significant challenge is striking a balance between aviation capacity needs of Southern California with local quality of life constraints for the affected populations.

Projected noise impacts from aircraft operations at the region's airports in 2035 were modeled for inclusion in the PEIR for the RTP. For each airport, modeling produced a contour or isoline for the 65 dB Community Noise Equivalent Level (CNEL), a measure of noise that takes into account both the number and the timing of flights, as well as the mix of aircraft types. The Federal Aviation Administration (FAA) considers residences to be an "incompatible land use" with noise at or above 65dB this CNEL level.

To identify potentially impacted populations, the anticipated population within the 65 dB CNEL contour was calculated by the following steps:

1. Calculating the percentage of TAZs that would lie within a 65 dB CNEL contour.
2. Assigning the SCAG projected population to the TAZ.
3. Applying the demographic breakdown of the TAZ as a whole to the population within the 65 dB CNEL contour.

FIGURE 5.21 INCOME DISTRIBUTION IN THE SCAG REGION VS. AVIATION NOISE AREAS (2035)

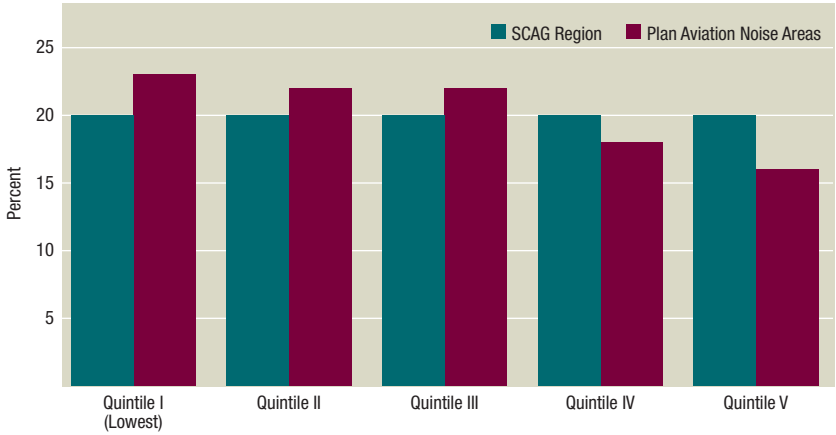


Figure 5.21 demonstrates that there is a marginal disproportionate impact between each income group in the 2008 RTP, which is similar to the findings in the 2004 RTP. The disparity between the lowest and highest quintile group is approximately 7 percent. Each income quintile (by definition) contains 20 percent of the Region's households in 2035. Under the Regional Aviation Plan in the 2008 RTP, the lowest income group (Quintile 1) will represent 23 percent of the households impacted by noise above the 65 dB CNEL.

FIGURE 5.22 ETHNIC/RACIAL COMPOSITION IN THE SCAG REGION VS. AVIATION NOISE AREAS (2035)

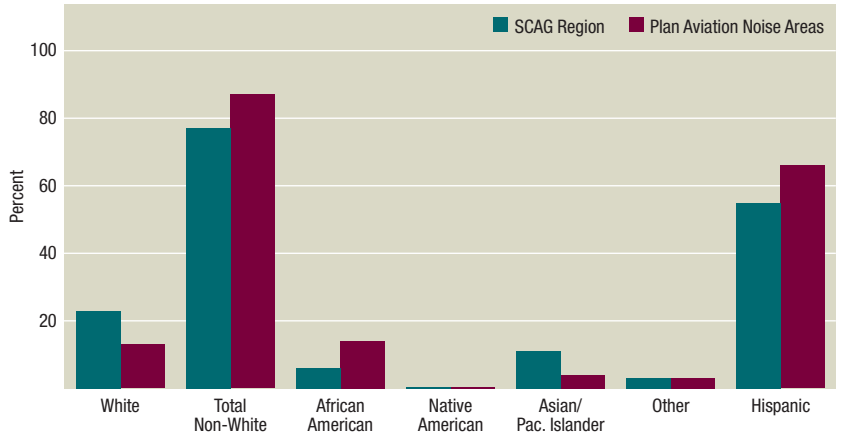


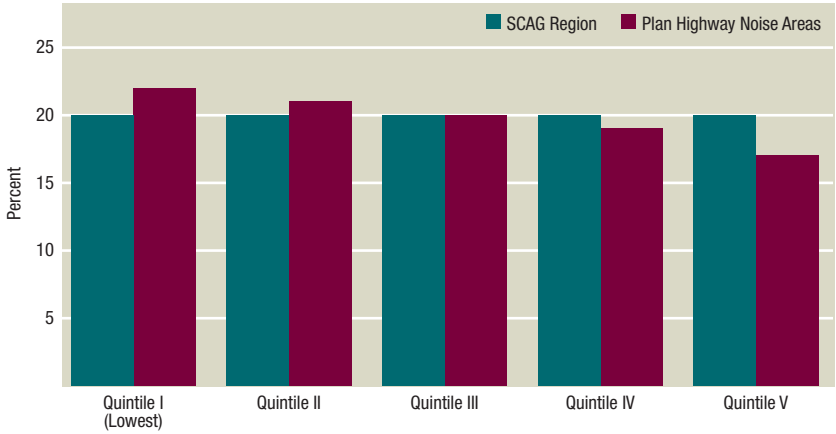
Figure 5.22 indicates that the 2008 RTP is projected to have a disproportionate aviation noise impact on minority and low-income groups. Although non-whites comprise 77 percent of the region's population in 2035, they will make up 87 percent of those affected by the 65 dB CNEL contour. In particular, 66 percent of the impacted population will be Hispanics.

Highway Noise Impacts

Noise associated with highway traffic depends on traffic volumes, vehicle speed, vehicle fleet mix (cars, trucks), as well as the location of the highway with respect to sensitive receptors. According to Federal Highway Administration (FHWA) guidance, noise impacts occur when noise levels increase substantially when compared to existing noise levels. For purposes of this analysis and consistent with FHWA guidance, noise increases of 3 dB along highways where noise levels are currently, or would be in the future, above 66 dB, are considered to be significant (regardless of adjacent land use).

The demographic characteristics of each impacted TAZ portion were aggregated and compared with the regional demographics to determine if there would be any disproportionate impacts to any of the demographic groups identified. This approach identified a marginal disproportionate impact between each income group (see Figure 5.23). The lowest income group will account for 22 percent of the affected population in 2035. There is a 5 percent difference between the lowest and the highest income quintiles.

FIGURE 5.23 INCOME DISTRIBUTION IN THE SCAG REGION VS. HIGHWAY NOISE AREAS (2035)

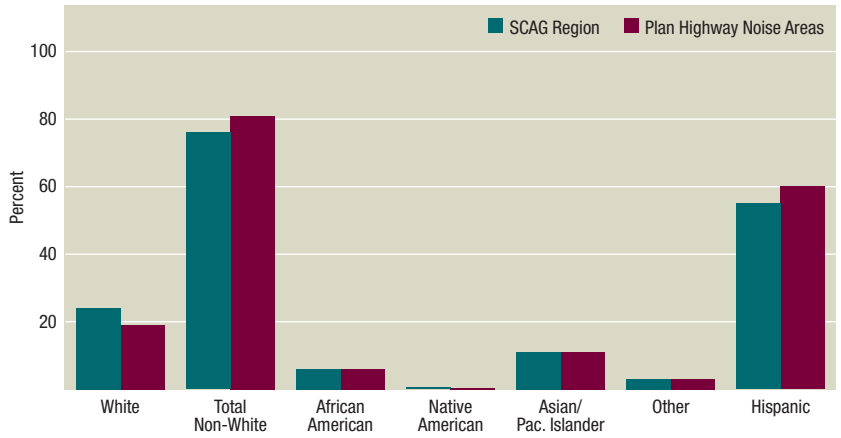


The 2008 RTP also found that minority populations were primarily affected by highway noise impacts. Figure 5.24 indicates that in 2035, Non-Whites will represent 76 percent of the total population but account for 81 percent of the affected population, in terms of highway noise. In contrast, Whites will make up 24 percent of the population but compose 19 percent of those adversely impacted by highway noise. Of the various ethnic groups, Hispanics are projected to experience the greatest disparity at 60 percent.

The identification of these disparate highway noise impacts at the regional level can be attributed to the issue of incompatible land use, where high-polluting transportation projects, such as freeway construction, airport expansions, or rail extension projects, are sited in minority populated neighborhoods. Protecting against this requires a corridor-level analysis for areas where burdens are concentrated. In addition, the 2008 RTP proposes miti-

gating these impacts to the extent possible, for example, by requiring new soundwalls where freeway expansions are proposed. Furthermore, the RTP also proposes grade crossings, new technologies, and other clean technologies for goods movement corridors.

FIGURE 5.24 ETHNIC/RACIAL COMPOSITION IN THE SCAG REGION VS. HIGHWAY NOISE AREAS (2035)



The 2008 RTP seeks to identify and address Title VI of the Civil Rights Act and any environmental justice implications of the planning processes and investment decisions. It is critical for SCAG and policy-makers alike to ensure that their transportation programs, policies, and activities serve all segments of the region without generating disproportionately high and adverse effects.

In the face of continued population growth, sprawling urbanization, increasing annual vehicle miles traveled, and an expanding economy, decision makers must make decisions that will have significant implications for the region's land use patterns, densities, nodes for growth and development, environmental health, livability, accessibility and equity. Accommodating the anticipated growth in the SCAG region in a sustainable way—by taking account of ecological, economic and social justice factors, while enhancing quality-of-life for present and future generations—represents the central challenge facing regional transportation planning in Southern California.

Health Impacts

Information on health impacts associated with transportation projects can be found in the Program Environmental Impact Report (PEIR) for the RTP. The PEIR includes an analysis of possible health effects along major freeway segments and a comprehensive list of mitigation measures to reduce impacts.

Economic Impact Analysis

DECLINE IN EMPLOYMENT GROWTH RATE

As revealed in current and previous RTP growth forecasts, the region's employment growth will slow down considerably after 2010, compared with historical trends. This sharp and unprecedented decline in job growth as well as underlying changes in the makeup of the labor force in the region are due primarily to a large number of "Baby Boomers" starting to reach the age of retirement. The share of total population and households of elderly and retired persons in the region is projected to double from today. These households are more likely to be headed by minorities (i.e., non-Hispanic White householders).

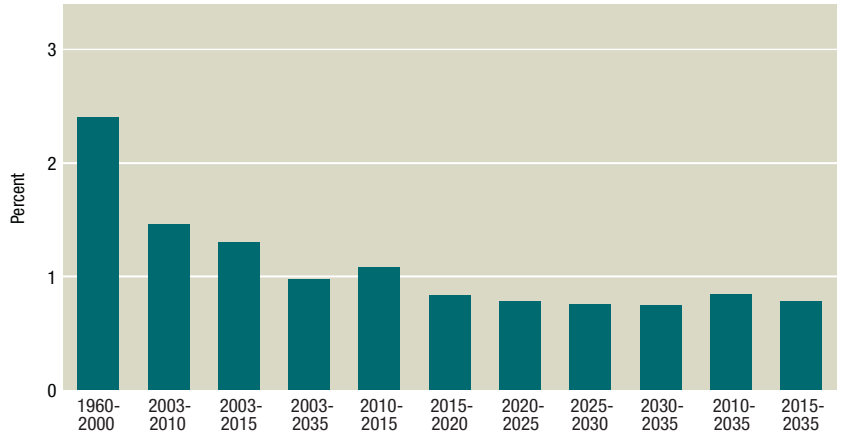
Unlike the 1960-2000 period, the region will not have a large labor force to support a relatively small retired population. Instead, the region will experience a situation in which a smaller labor force made up of minority households will be supporting a relatively large retired population made up of non-minority households. Increased by immigration, these minority households will be larger, consist of multiple generations, and be headed by younger individuals

in the workforce. The size of our labor force as well as employment growth will be sensitive to these changes in demographics.

During the 2003-2035 forecast period, employment growth will be constrained by the size of the anticipated labor force. A major challenge for the region will be to prepare and match younger workers with future jobs. Matching needed skills and education levels with new and especially better-paying future jobs will affect migration trends and immigration levels. These impacts will be felt the most after 2010. During the last 40 years (1960–2000), while the region expanded its job base at an annual compound growth rate of 2.4 percent, the region's job growth rate is now projected to be only 0.84 percent during the 25-year period between 2010 and 2035 (Figure 5.25).

This is about one-third of what was achieved in prior decades. The projected employment growth trends after 2010 suggest an imbalance between the size of the labor force, the retired population that employed workers must support, and the amount of job growth that can be achieved. As a result, the regional economy is expected to face tremendous downward pressure and may not be able to produce the jobs, wealth, and prosperity that it did in prior decades. The economic health of the region is tied to job growth, particularly the creation of high-paying jobs that match the skills and education level of the region's future workforce made up primarily of households headed by minority populations.

FIGURE 5.25 HISTORICAL AND PROJECTED SCAG REGION EMPLOYMENT GROWTH RATES



PUBLIC AND PRIVATE SECTOR INVESTMENTS

The 2008 RTP proposes investing $239.2 billion in 2007 constant dollars (or $413.1 billion in nominal dollars) from public funding sources between 2007 and 2035. In addition, consistent with strategies laid out in previous SCAG RTPs, the 2008 RTP continues to emphasize using innovative financing tools, such as user-based fees and direct investment from the private sector to address challenges limiting transportation revenue growth, constraining transportation investments, and enlarging gaps in unmet transportation demand. The innovative funding revenues which are deemed reasonably available for the 2008 RTP planning horizon are projected to be around $80.3 billion in 2007 constant dollars (or $132 billion in nominal dollars) between 2007 and 2035.

The economic impacts from private-sector-funded projects are different from those funded by tax dollars. Since transportation projects funded by retail

sales and gasoline tax revenues are simply extensions of past economic trends, most of their economic impacts are reflected either in the existing employment base, or in the baseline employment growth forecast. However, enabling private sector engagement in transportation investments through innovative financial arrangements will generate and create new economic activities not experienced before and not captured by past historical trends. As a result, private sector investments in transportation infrastructure will work to boost regional economic and job growth above the baseline growth forecast (Economic Impact Analyses for the 1998, 2001, and 2004 RTPs).

The impacts of the RTP expenditures were estimated using the economic input/output model (IMPLAN) and are presented in Table 5.6. The implementation of public-sector-funded infrastructure projects recommended in the 2008 RTP is projected to account for almost 120,000 jobs annually, while projects proposed in the RTP funded through innovative financing would create a net additional 34,900 jobs annually during the planning period.

TABLE 5.6 AVERAGE ANNUAL ECONOMIC IMPACTS FOR 2008 RTP (DIRECT, INDIRECT AND INDUCED IMPACTS)

	Average Annual Investment (Millions $2007)	Employment (No. of Jobs)	Output (Millions $2007)	Income (Millions $2007)
Public Sector	$8,540	119,600	$15,300	$4,200
Private Sector	$2,870	34,900	$5,200	$1,300

Source: Draft 2008 RTP & SCAG Input-output Model